

> interference-free system in Penn Yan. He was then asked what people could
> do if they felt they needed to complain to DVI about interference so that it
> could get taken care of. His reply was, "You can call the Operations
> Center." When asked for the phone number, he replied, "I don't have it-
> call me instead." and GAVE US HIS CELL PHONE NUMBER! I asked him how the
> company expected to make any money supplying this service to the rural
> customers (there were a number of people from well outside the city
> present), and his reply was "WE NEVER STATED THAT WE WOULD BE SUPPLYING BPL
> TO THE FARMERS SPREAD MILES APART- WE'RE DEPLOYING THE SERVICE IN SMALL
> CITIES AND TOWNS." I then reminded him of FCC Chairman Powell's statement
> when the NPRM was released "I am optimistic and welcome the day when every
> electrical outlet will have the potential to offer high-speed broadband and
> a plethora of high-tech applications to all Americans." His comment was
> (this is beautiful!) "I read Chairman Powell's statements every day- he
> never said that."
>
> Several members then started asking me questions (they had been to our
> club's website and heard the recording there), and I did my best to answer
> them. My main point in being there was to make sure that these people, if
> they had experienced interference, would lodge complaints to the FCC, and to
> make sure that they understood the importance of commenting on the NPRM. So
> my thrust was there. But I did offer to let anyone who hadn't heard the
> interference yet, come out to my truck after the meeting and I'd give them a
> demo.
>

> At this point, the topic had been pretty well covered, so the meeting
> officially ended. I asked for their business cards, Simmons gave me his,
> but Loew "Didn't have any." I gave them mine. Simmons and Loew got up to
> leave, but Simmons was cornered by several members who wanted to ask more
> questions. Loew quietly slipped out the door. Ayers and I answered a few
> more questions, then it was time to go.
>
> We went outside and those that were left wanted to see my mobile setup and
> hear the interference. Guess what? IT WAS GONE!!! THE SYSTEM HAD BEEN
> SHUT DOWN, either in the time before Simmons and Loew got to the meeting
> (maybe why they were late), or when Loew slipped out the door at the end.
> Everything was gone, completely. Interestingly, this explains why I got an
> email from a ham who went to Penn Yan last Saturday (4/17) and found
> nothing, yet another person (this one from Harris Corp) was there on the
> same day and heard everything just as I had reported it. I think this
> action speaks even louder than the interference about just what is going on
> here, and does not present the BPL providers in a positive light at all.
>
> I was able to convince several people to lodge formal complaints to the FCC
> about the interference they had experienced, and I believe they will.
>
> I'm sure there's more to come from this.
>
> Dave Hallidy K2DH
--- End forwarded message ---

James Burtle

From: Dave Hallidy [k2dh@frontiernet.net]
Sent: Wednesday, October 06, 2004 11:00 PM
To: Anh Wride; Alan Stillwell; Riley Hollingsworth; James Burtle; Sheryl Wilkerson
Cc: Ed W1RFI Hare; Dave Hallidy
Subject: Effectiveness Of "Notching" BPL Signals In Amateur Radio/SWL Bands

Dear FCC Staff-

I have recently seen discussions related to the FCC's opinion that notching is an effective tool to mitigate BPL interference in the Amateur Radio HF bands. I've been closely involved with monitoring the system trial that was conducted (and recently terminated) in Penn Yan, NY. I'd like to share with you my experiences and observations that contradict this opinion.

DVI (the BPL provider in Penn Yan) and their equipment supplier, Amperion, used notching to attempt to reduce the level of BPL interference observed by me and others. In my initial complaint to the FCC in late March, 2004, I noted that strong BPL signals were observed continuously from below 18 MHz to above 30 MHz. DVI and Amperion reported that they had worked to improve the situation and on my second visit (in late May, 2004), I observed the following (I would also note here that the FCC never replied to any of my complaints in this matter) (the information below is excerpted and quoted from my second official complaint to the FCC):

"DVI (the provider) has made an attempt to reduce the interference to the Amateur spectrum in Penn Yan. They have been partially successful.

- 1) The 10m band (28.00-29.70 MHz) is clear of any BPL (it was completely covered with BPL during my first visit).
- 2) An attempt has been made to notch out BPL from the 15m band (21.00-21.45 MHz).
- 3) An attempt has been made to notch out BPL from the 12m band (24.890-24.990 MHz).
- 4) No attempt has been made to remove BPL from the 17m band. The 17m band (18.068-18.168 MHz) is completely covered up with strong BPL (as it was on my first visit).
- 5) The 15m band is only partially cleared of BPL. The lower 100kHz of the 15m band is completely covered up with strong BPL (the entire 15m band was covered up during my first visit), and residual carriers exist up to about 21.16 MHz.
- 6) The 12m band is only partially cleared of BPL. The lower 20kHz of the 12m band is completely covered up with strong BPL (the entire 12m band was covered during my first visit). In addition, the notch in the 12m band is rather ineffective- the residual signals never disappear."

As you can see, in their attempts to move and notch the BPL spectrum to mitigate interference, Amperion demonstrated only limited control of their hardware. I also have observed that energy from the Amperion BPL system is not well-contained within it's intended spectrum blocks. Residual signals spill over into neighboring spectrum. These signals ARE weaker than the main "intended" signal, but only attenuate gradually as one tunes away from the edge of the main signal.

In addition to interference in the Amateur bands, apparently no one at DVI or Amperion had given any thought to interference to the International Shortwave Broadcast Bands. The system in Penn Yan showed no attempt to notch or reduce interference there in any way, and moderately strong signals in the SWBC bands were obliterated by BPL.

My belief is that at some point in time, the technology employed by the manufacturers of BPL equipment will be both advanced enough and agile enough to effectively mitigate interference by the use of notching techniques. Today, at least in the experience I've had in Penn Yan, I must conclude that the equipment presently available does not have the capability to do this.

Sincerely,

David Hallidy K2DH
663 Beadle Road
Brockport, NY 14420
585-637-0696

James Burtie

From: James Burtie
Sent: Thursday, March 11, 2004 12:08 PM
To: 'ed.wallace@pgnmail.com'; 'matt.oja@pgnmail.com'
Subject: Interference complaints

Jeff Keller

Mr. Wallace and Mr. Oja,

This is the interference complaint that I told you about. I have included two others that we have received. Please contact the complainants and resolve the interference. Once the interference has been resolved, please send the complainants an e-mail asking him to respond indicating that the interference problem has been solved. Once you have received that e-mail, please forward it to me.

Thank you,

Jim Burtie

Chief, Experimental Licensing Branch

Federal Communications Commission

Dear Mr. Godwin and Mr. Poole,

I am a ham radio operator in Raleigh, NC (N4XD) and recently was able to experience first hand the radio interference generated by BPL. I, along with several others, visited the system under trial in Fuquay-Varina that Progress Energy is running. It is in the Woodchase Subdivision.

When we visited the subdivision we tuned an Icom 706Mk2 radio to the 10 meter ham band (28Mhz through 29Mhz). Across the whole spectrum we encountered strong interference. On the S meter of the radio we saw readings from S5 to S7. This was with a simple vertical antenna. With a gain antenna which is what many of us use, the readings would have been much higher. A level of interference this high seriously impedes communications on the frequencies being affected.

To my surprise the interference was not on discrete frequencies but rather spanned the entire band from 28 to 29Mhz. Interference, to a lesser degree, was also heard on the 24Mhz ham band.

This interference seemed to be generated from just one location which, if I understand correctly, was the injection point for the trial deployment. The signals from this could be heard as we drove through the sub division. I can only imagine what will happen when many of these points are in action. Communication as we now know it will be gone.

I would also like to comment on a subject that was commented on in the recent FCC writings. It has to do with line noise. The comment from the FCC was that since we (hams) are dealing with it now the FCC feels that we just point our antennas away from the line noise. This just isn't the case. Perhaps some hams that only wish to communicate in one direction can and do do that but I for one have moveable directional antennas to maximize my receiving capability in a variety of directions based on where the station is that I wish to work. I do not leave the antennas in one direction.

I strongly feel that the line noise issues we seem to face every year is a fine example of how we battle noise that is covered by part 15. While the power companies are typically responsive it is difficult, perhaps impossible, to eliminate the interference caused by line noise. If we can't eliminate an existing well known source of interference then how can the FCC expect the interference caused by BPL to be any different? I find it offensive that the FCC turn this existing problem into justification for BPL!

I am sure that the majority of hams would love to see every household be able to access the internet via a broad band connection. We are not against that. In fact I have a second home that would greatly benefit from this kind of service. We just want to see a system that can do it without the well documented interference generated by BPL.

Thank you for your time and consideration.

Ron Spencer
N4XD

Dear Mr. Godwin and Mr. Poole,

I am writing to report my personal observation of radio interference generated by the Progress Energy BPL system that is currently operational in the Fuquay Varina, NC area, more particularly, the Woodchase subdivision.

I am a amateur radio operator(NX9T) and have a mobile transceiver installed in my vehicle. I operate mobile on many of the assigned amateur frequencies and when entering the area described above on Saturday February 28th, 2004, at approximately 9:30am, encountered significant radio interference in the 10meter and 12 meter ham bands(24mhz and 28/29 mhz).

The interference generated by the BPL unit located on a power pole just in front of the subdivision was radiating a signal so strong that it would severely limit communication capabilities on the frequencies listed above. The signal/interference was so strong that it was registering a S7 to S9 reading on the Icom 706 amateur transceiver. For informational purposes, typical signals are usually in the S5-S7 range which would be completely covered up by the BPL interference. The interference was detected between .5 and 1 miles from the pole identified.

I hope this information is helpful as you assess the realities of BPL and the issues at hand. Please earnestly look into this particular interference complaint but even more importantly, seriously evaluate the BPL generated interference issue in a more global manner.

Thank you for your time.

Jeff Keller
Amateur radio operator NX9T
4500 Clear Cut Court
Wake Forest, NC 27587
919-861-8696

Gentlemen,

I would like to log a complaint regarding radio frequency interference at my home in Fuquay-Varina, NC. I operate a amateur radio station call sign N1UJ at my home 509 Wyndham Drive (Sandy Springs Subdivision). Over the last few weeks I have been experiencing interference across the amateur 10 meter band (28.000.00Mhz to 29.700.00Mhz) and the amateur 12 meter band (24.890.00Mhz to 24.990.00Mhz). I have identified the interference radiating from the Woodchase subdivision off of James Slaughter Road located 0.64 miles from my home. I understand the Woodchase subdivision is one of Progress Energy's BPL test sites. Please contact me to discuss your course of action to resolve this interference.

Theodore J. Root, N1UJ Amateur Radio Operator
509 Wyndham Drive
Fuquay-Varina, NC 27526
919-557-4372
n1uj@nc.rr.com

James Burtie

From: Dick Orander [kd4isc@worldnet.att.net]

Sent: Thursday, March 11, 2004 4:55 PM

To: bill.godwin@pgnmail.com; stephen.poole@pgnmail.com

Cc: Anh Wride; Riley Hollingsworth; David Solomon; James Burtie; w1rfi@arrl.org; w4fal@smithchart.org

Subject: BPL Interference Complaint

Dear Sirs:

I would like to log a complaint regarding radio frequency interference in an area that I travel through in Fuquay Varina, NC. I operate a mobile amateur radio station (call sign KD4ISC). Recently, I have been experiencing interference in the 28.- 29 MHz frequency range. I have detected this interference in an area within a half mile of the intersection of James Slaughter Road and Road Street (Hwy 55) near Fuquay Varina. I understand this area is one of the Progress Energy BPL test sites. Please contact me to discuss your course of action and an expected date of resolution of this interference.

Thank you,

Dick Orander KD4ISC
104 Wilshire Drive
Fayetteville, NC 27511
kd4isc@arrl.net

3/26/2004

Alan Stillwell

From: James Burtle
Sent: Friday, March 12, 2004 12:58 PM
To: Alan Stillwell; Bruce Franca
Subject: FW: Progress Energy BPL

-----Original Message-----

From: James Burtle
Sent: Friday, March 12, 2004 8:46 AM
To: 'ed.wallace@pgnmail.com'; 'matt.oja@pgnmail.com'
Subject: FW: Progress Energy BPL Complaints

Mr. Wallace and Mr Oja,

And another one.

Jim Burtle

-----Original Message-----

From: Frank A. Lynch [mailto:flynch@nc.rr.com]
Sent: Friday, March 12, 2004 5:39 AM
To: Bill Godwin; Poole, Steve
Cc: Gary Pearce; Tom Brown; Ed Hare; David Sumner; Chris Imlay; Anh Wride; David Solomon; James Burtle; Norman Young; Danny Hampton; John Covington, W4CC
Subject: Progress Energy BPL Complaints

Let's review what I have on Progress Energy BPL complaints thus far:

Ted Root N1UJ
Ron Spencer N4XD
Jeff Keller NX9T
Bob Condor K4RLC
Frank Lynch W4FAL

These complaints were made between March 3 and March 10. I am working with several of the hams that are on the attached map to also file written complaints (some are reluctant to file a complaint since they know complaints have already been filed ... It's the old.. they know it's

3/12/2004

causing a problem, why do they need me to tell them again...)

Other Amateur stations (from the map that are able to hear the signal at their residence) include,

W4RLH
KD6IET
KM4UT
K4ITL
KC4SAM
WA0AFW

This list, I believe covers everyone who lives within a 2 mile radius of any of the trial sites that are active on the Amateur HF bands. I have heard informally over the air of other stations who were operating mobile in the area that have experienced high levels of interference on Holland Church Road and James Slaughter Road, but to my knowledge none of them have yet filed a complaint direct to Bill Godwin.

Progress has acknowledged the interference and has I believe replied either in writing and/or via a phone call to all involved. In my mind what has been observed in the trial areas is sufficient evidence that the Amperion system as it exists today does and can cause levels of interference that would be categorized as "harmful". Progress has also stated that they have asked Amperion to modify their equipment to "notch out" the radio bands.

From FCC Rules Part 15

Harmful interference. Interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunication service operating in accordance with the Radio Regulations.

Part 15.5 further states:

(b) Operation of an intentional, unintentional, or incidental radiator is subject to the conditions that no harmful interference is caused and that interference must be accepted that may be caused by the operation of an authorized radio station, by another intentional or unintentional radiator, by industrial, scientific and medical (ISM) equipment, or by an incidental radiator.

(c) The operator of a radio frequency device shall be required to cease operating the device upon notification by a Commission representative that the device is causing harmful interference. Operation shall not resume until the condition causing the harmful interference has been corrected.

While Progress has been very cooperative with working the local Amateur Radio community, there has yet to be a demonstration of any sort of mitigation techniques with respect to interference. While the number of amateur radio operators within the trial communities is less than 2 dozen, this in no way diminishes the responsibility to mitigate reported interference based on numbers of affected users. I think it's also

3/12/2004

important that Progress, Amperion, the FCC, and local amateur operators realize that without exception, amateur operators within 1 mile of the sites with overhead distribution of BPL signals have been able to hear these signals with average amateur installations. Amateurs with more elaborate antenna systems can hear the signal greater than 1 mile. Unlike other forms of man-made and natural interference that occurs on HF bands, BPL signals are present continuously and at levels that prevent amateur stations from using the affected bands.

The extent of the effect upon skywave propagation we don't know, for a couple of reasons. For the past several months, due to the declining sunspot cycle, the 28.0 to 29.7 MHz amateur band has generally not been "open" to skywave propagation. Also, even if it was, how would a distant station determine the source of BPL that he might be hearing via skywave propagation. There is no identification that indicates the location, owner, etc. of the BPL equipment.

On January 15, 2004, Progress Energy invited local Amateur Radio Operators to observe a test location in southern Wake County. This site exhibited substantial levels of radiation in the 26-31 MHz range and we asked the Amperion Engineer to "swap" frequency blocks to demonstrate the mitigation capability. His reply suggested that the Amperion NOC (Network Operations Center) operator was busy with other tasks and hadn't the time to do so. Admittedly, no formal complaint was registered, but thoughts toward due diligence would have caused me to institute this change, if for no other reason than to confirm to Progress Energy and Amateur Radio Operators that it is an easy process.

That this was *not* done and has yet to be demonstrated despite several complaints by amateur operators of interference in the 10 Meter and 12 Meter amateur bands, suggests that it is not an easy process and one which could not be undertaken without significant re provisioning of the network.

Having said that, this absence of action or oversight, suggests that the interference mitigation process is not a simple undertaking. Further, if interference mitigation in a simple system, such as this single-span overhead example, cannot be easily accomplished, what will happen later, when a complex system is built and encountered?

The local amateur community is anxious to hear;

- when does Progress Energy expect to have a mitigation solution from Amperion?
- will we have an opportunity to test the solution for both interference to amateur operators as well as its resistance to being interfered with by amateur radio users?
- In the event that a mitigation solution cannot be arrived at within a few weeks, will Progress shut the system down until a solution is found?

I look forward to hearing from you in the near future.

Thank you,

3/12/2004

Frank A. Lynch, W4FAL
ARRL NC Technical Specialist
2528 Oakes Plantation Drive
Raleigh, NC 27610-9328
919-740-3957
w4fal@smithchart.org

Len Anthony, Progress Energy Regulatory Affairs

cc:

Bill Godwin, Progress Energy

Anh Wride, FCC

David H. Solomon, FCC

James R. Burt, FCC

Riley Hollingsworth, FCC (FYI)

Ed Hare, ARRL

Frank A. Lynch, ARRL

Saturday, March 13, 2004

This e-mail letter is a formal complaint of interference received from several Broadband over Power Line (BPL) installations operated by Progress Energy in the Wake County, North Carolina area.

I am:

Gary Pearce KN4AQ

116 Waterfall Ct.

Cary, NC 27513

919-380-9944

kn4aq@arrl.net

I encountered all of this interference while mobile, or visiting the stations of other amateur radio operators. I do not hear any BPL interference at my home in Cary at this time.

November 16, 2003. I first encountered BPL interference on this date, near the Wakefield subdivision in north Raleigh, along Falls of the Neuse Road near Wakefield Pines Rd. The interference appeared as a series of closely spaced RF carriers, approximately 1 kHz apart, covering the lower half of the 10 meter amateur radio band, from 28 to near 29 MHz (and some spectrum below that band, including the 40 CB radio channels near 27 MHz). Some of the carriers had a little "tik-tik-tik" sound at about a 2 Hz rate. The interference was strong - S-9 - for about a half mile along Falls of the Neuse Road, and obliterated several amateur radio signals that I was monitoring.

I understand this was the Phase I trial area, and the test has been discontinued.

January 15, 2004. On this and several subsequent dates, I received interference while driving along Holland Church road between 1010 Road and Pagan Rd. in southern Wake County, specifically in the vicinity of Feldman Dr. The signature of the interference was the same: closely spaced carriers, about 1 kHz apart, some with a tik-tik-tik modulation, and occasionally a longer burst of what sounded like data. The interference covered two blocks of spectrum, from 23.44 - 26.08 MHz (including the amateur radio 12 meter band) and 27.9 - 31.7 MHz, (including the amateur radio 10 meter band). The interference was strong - S-9 - for about a half mile along Holland Church road, and audible in places along Pagan Rd. It obliterated several amateur radio signals that I was monitoring as I drove through the area.

I have subsequently been through this area several times, and the interference is still present. My last visit was on February 28th.

This interference was across 21.9-25.7 MHz (including the amateur radio 12 meter band) and 27.5-30.0 MHz (including the amateur radio 10 meter band). The interference was S-9 along James Slaughter Road, and S-5 in the Food Lion parking lot at NC-55, and obliterated several amateur radio signals that I was monitoring.

I most recently heard this interference on March 5th, 2004:

Mike Payne KM4UT
5813 HEATHILL CT
Raleigh, NC

Ted Root N1UJ
509 WYNDHAM DR
Fuquay-Varina, NC

Roland Erickson WA0AFW
201 WILBON ROAD 301B
Fuquay-Varina, NC

C:\Program Files\Internet Explorer\Internet Explorer.exe 5/5/2004

You might ask if my complaint of interference while mobile, some distance from my home, is justified. I contend that it is, for several reasons.

First, amateur radio is a very "mobile" service. Tens of thousands of amateur radio operators have and use high frequency mobile equipment, and we can be found anywhere, using all hf bands, at completely unpredictable times.

Second, the Progress Energy Phase II trials are in very limited area tests. There are no amateur radio operators living inside the neighborhoods being served, though there are several within interference range - about a mile. We are justified in traveling to the sites with normal amateur radio equipment, operated in a normal manner, to observe and complain about interference we receive. This observation must be extrapolated to a wider geographic area to anticipate the kind of interference that would be received if BPL were to be widely deployed, especially in denser suburban and urban neighborhoods.

You might also ask if weak BPL signals constitute harmful interference. I contend that they do. Amateur radio operation is unlike most other radio operation, in that amateurs tune across their band segments looking for signals. Often we are looking for weak signals from distant parts of the world. Our predominant modes are single sideband and cw. In those modes, a series of carriers 1 kHz apart presents a most irritating series of "beat notes" - tones that vary in pitch as the spectrum is tuned. At 1 kHz spacing, they are continuously present in a receiver using customary bandwidth filters. And even weak BPL signals can make weak amateur radio signals difficult or impossible to receive.

The presence of any BPL signal of any strength at either a home or mobile station at any location is an unwarranted incursion in the amateur radio bands, and is also a problem for anyone tuning shortwave broadcast or other radio services.

Thanks for your consideration. I look forward to hearing the results of the investigation into my complaints.

Sincerely,

Gary Pearce KN4AQ

Gary Pearce KN4AQ editor, SERA Repeater Journal

Cary, NC www.sera.org

919-380-9944 kn4aq@sera.org

kn4aq@arrl.net

AOL/Yahoo Instant Messenger: KN4AQ
(send e-mail to be put on my "buddy list")

Alan Stillwell

From: Anh Wride
Sent: Monday, March 29, 2004 1:15 PM
To: Bruce Franca; Alan Stillwell; Karen Rackley; Alan Scrim; William Hurst; Steve
Subject: FW: 2nd interference complaint regarding Progress Energy Phase II BPL

fyi

-----Original Message-----

From: Gary Pearce KN4AQ [mailto:kn4aq@arrl.net]
Sent: Monday, March 29, 2004 12:57 PM
To: len.anthony@pgnmail.com
Cc: Anh Wride; James Burtie; w1rfi@arrl.org; w4fal@smithchart.org; Bill Godwin; Riley Hollingsworth
Subject: 2nd interference complaint regarding Progress Energy Phase II BPL

To: Len Anthony, Progress Energy Regulatory Affairs

From: Gary Pearce KN4AQ
116 Waterfall Ct.
Cary, NC 27513
919-380-9944
kn4aq@arrl.net

cc:
Bill Godwin, Progress Energy
Anh Wride, FCC
James R. Burtie, FCC
Riley Hollingsworth, FCC (FYI)
Ed Hare, ARRL
Frank A. Lynch, ARRL

Monday, March 29, 2004

This e-mail letter is a second formal complaint of interference received from several Broadband over Power Line (BPL) installations operated by Progress Energy in the Wake County, North Carolina area. This complaint covers interference on NEW frequencies that was not present in my first complaint filed on March 13th.

3/29/2004

In my March 13th complaint I detailed interference that I observed while operating my mobile amateur radio equipment in the vicinity of the Progress Energy Phase II BPL trial areas in southern Wake County, North Carolina. No one from either Progress Energy or the FCC has contacted me as a result of that complaint (except a request from the FCC to drop David Solomon from the recipient list, which I have done). I have seen Bill Godwin in a somewhat chance encounter at the Holland Church site, and we had a good discussion on the state of the trial.

I have observed that Progress Energy has changed the spectrum used for the overhead line segments in both trial areas. If I'm correctly assuming that this was done to respond to complaints, and demonstrate frequency agility and the ability to mitigate interference by avoiding amateur radio spectrum, the attempt is appreciated, but it was not completely successful. New amateur radio and shortwave spectrum is now receiving interference, and that is the basis of this complaint.

On March 20, 2004, in the Woodchase subdivision area near Fuquay-Varina, where BPL signals had covered the 12 and 10 meter bands, I observed clear, strong BPL signature signals from 21.5 to 24.90 MHz, and 25.49 to 28.0 MHz. This almost cleared amateur radio spectrum, but not quite.

The lower segment, from 21.50 to 24.90 MHz, encroached clearly on the bottom 10 kHz of the 12 meter band, from 24.89 to 24.90 MHz, and what I'll call "residual" BPL carriers - carriers at the edge of the main spectrum that trail off in amplitude over the course of 10 to 20 kHz - encroached further. The residual carriers present a correspondingly decreasing problem of interference, but when the bulk of the BPL carriers are strong, the residual carriers can also interfere with weak amateur radio signals.

Note that if a BPL operator is attempting to place a BPL block adjacent to the bottom of an amateur band, they should be aware that these residual carriers will fall across an area of extreme interest where amateurs use Morse code to communicate with distant, often very weak, amateurs in remote parts of the globe. Additional care should be taken to avoid letting this "residual" interference cross the bottom few kHz of any amateur band.

The higher segment, from 25.49 to 28.0 MHz, also left some residual carriers encroaching on the bottom of the 10 meter band at 28 MHz. The main carriers did cover all 40 CB channels and interfered with signals I monitored there.

Then I drove through the Holland Church Road trial site and observed no change since my March 13th complaint - the BPL signals still covered the 12 and 10 meter ham bands and adjacent spectrum.

On March 23, 2004, I returned to the Holland Church Road trial area. That's when I ran into Bill Godwin and two other Progress Energy engineers, observing and reporting on some difficulty that Amerperion was having moving the spectrum on the overhead line. The signals were gone from the 12 and 10 meter bands, and appeared erratically elsewhere. Since this was an effort in progress, I didn't worry about the signals I received.

3/29/2004

On March 28, 2004, I returned to the Holland Church site again. This time I monitored signals on the following spectrum blocks:

14.29 - 16.805 MHz

17.33 - 21.00 MHz

24.53 - 28.00 MHz (with 12 meter notch?)

Reception was somewhat difficult because of a high general noise level (what we usually refer to as "power line noise," ironically in this case. The true source of this particular noise is unknown). The BPL signature signals were generally strong and clear above this noise.

After observing what appeared to be an attempt to completely avoid amateur radio spectrum at the Woodchase trial area, I was disappointed to see that two busy amateur radio bands were partially or fully covered here: 20 and 17 meters. The BPL carriers interfered with many signals as I tuned from 14.29 to the band-edge of 14.35 MHz in the 20 meter band. Strong signals were audible, but BPL carriers placed a loud "beat note" behind them, making reception irritating at best. Weaker signals were rendered unreadable.

I had the same situation across the entire 17 meter band, from 18.068 to 18.168 MHz. Weaker signals were impossible to receive, while stronger ones were accompanied by a loud heterodyne whistle.

I also tried listening to some shortwave broadcast signals in the spectrum immediately above the 20 meter ham band. Switching to AM reception with a 6 kHz band pass filter, I noticed that the BPL signals were a continuous "blanket" across the spectrum. Since the BPL carriers were 1.1 kHz apart, I heard the expected 1.1 kHz heterodyne tone as part of that interference blanket.

The 15 MHz signal from WWV was completely inaudible. Stronger shortwave signals were audible with varying degrees of interference. Weaker signals on 15.160, 15.205, 15.300, and 15.350 MHz were detectable but not readable. This was just a brief sample of the many shortwave signals that received interference from the BPL energy.

I could not observe any "residual" carriers spilling into the 15 meter ham band as the "power line noise" made it difficult to hear the weakest BPL carriers. With some difficulty I observed what appeared to be a notch in the 24.53 - 28.0 MHz block. The carriers were at least attenuated in the 24.89 - 24.99 MHz area (the 12 meter ham band), but I thought I could hear some weaker carriers through the "power line noise".

That is my report. I'll repeat my contention from my first complaint that interference reports from mobile stations are warranted because:

- amateur radio is a very mobile radio service,

- these are very limited trial areas, and the experience and results must be extrapolated to predict the effect BPL will have if widely deployed in densely populated areas.

I'll conclude with an example of truly random interference caused by BPL to a mobile ham who was not part of, or recruited by, our investigation team:

Over the past few weeks I've had an e-mail exchange with Andy Stoy K4MTN, from Wake Forest, NC. Initially, Andy's e-mail sounded like many that Tom Brown N4TAB, Frank Lynch W4FAL and I have received from area hams who suspect that they are hearing BPL interference from areas where none is known to exist. Andy said he had been hearing loud interference - he called it "static" - for months along a half-mile stretch of Falls of the Neuse Road near the Woodfield subdivision. He was describing the Phase I trial area which we believed to have been disconnected, and his description of "static" didn't sound like the BPL signature we're used to.

I pressed him for more specific details, and he finally described the exact location, and the signature sound (closer-spaced carriers with a clicking sound) of Amperion's BPL. Tom Brown traveled to the site and confirmed that the Phase I equipment was still operating on the overhead line along Falls of the Neuse Rd. Andy traveled that route daily, and regularly operates on the 10 meter band. He had been receiving interference and loss of communications on that stretch of road since at least last fall, but didn't know what caused the problem until we began publicizing the trials. Then he contacted us. He will be filing his own report of interference.

Andy's story may seem isolated, a rare, chance occurrence. It is significant for several reasons. One is that it happened at all, since there is a total of less than two miles of BPL coverage along Wake County highways. Another is that hams don't know what BPL is yet. We've reached a few with our message, but many more have never heard of it. So there may be a few more Andy Stoy's out there who have passed through the existing trials areas, received interference, and didn't know what it was or who to call.

I appreciate the fact that Progress Energy and Amperion are responding to our reports and complaints of interference. I'd prefer to just call them "reports," but public proclamations that "there have been no interference complaints" have pushed us to this formal posture. My goal is to make you (Progress Energy and the FCC) aware of the real conditions for radio amateurs and other HF spectrum users in the trial area so that you can anticipate the level of difficulty you can expect in a broader implementation.

I'd expect that Progress Energy and Amperion could completely avoid amateur radio spectrum in the overhead segments of this limited trial area. I'm surprised that after the first complaints, you moved to occupy different amateur radio spectrum. But even if you had completely missed ham bands in this first move, success in this limited arena is not a good predictor of the ability to mitigate interference in a full system, where you will be constrained to use more spectrum and not re-use spectrum for several line segments. And the question of interference from the underground line segments has not been addressed at all.

Sincerely,

Gary Pearce KN4AQ

3/29/2004

===== KN4AQ's March 13, 2004 complaint, for reference =====

I encountered all of this interference while mobile, or visiting the stations of other amateur radio operators. I do not hear any BPL interference at my home in Cary at this time.

November 16, 2003. I first encountered BPL interference on this date, near the Wakefield subdivision in north Raleigh, along Falls of the Neuse Road near Wakefield Pines Rd. The interference appeared as a series of closely spaced RF carriers, approximately 1 kHz apart, covering the lower half of the 10 meter amateur radio band, from 28 to near 29 MHz (and some spectrum below that band, including the 40 CB radio channels near 27 MHz). Some of the carriers had a little "tik-tik-tik" sound at about a 2 Hz rate. The interference was strong - S-9 - for about a half mile along Falls of the Neuse Road, and obliterated several amateur radio signals that I was monitoring.

I understand this was the Phase I trial area, and the test has been discontinued.

January 15, 2004. On this and several subsequent dates, I received interference while driving along Holland Church road between 1010 Road and Pagan Rd. in southern Wake County, specifically in the vicinity of Feldman Dr. The signature of the interference was the same: closely spaced carriers, about 1 kHz apart, some with a tik-tik-tik modulation, and occasionally a longer burst of what sounded like data. The interference covered two blocks of spectrum, from 23.44 - 26.08 MHz (including the amateur radio 12 meter band) and 27.9 - 31.7 MHz, (including the amateur radio 10 meter band). The interference was strong - S-9 - for about a half mile along Holland Church road, and audible in places along Pagan Rd. It obliterated several amateur radio signals that I was monitoring as I drove through the area.

I also received interference with the same signature in several spots along Feldman Dr., in various other segments of the high-frequency spectrum - near 11 and 15 MHz in particular. The signals were weaker, but plainly audible. One caused a "beat note" against the 15 MHz WWV time and frequency reference signal.

I have subsequently been through this area several times, and the interference is still present. My last visit was on February 28th.

February 20, 2004. On this and several subsequent dates, I received interference while driving along NC Highway 55 and James Slaughter Rd, just north of the town of Fuquay-Varina. The interference was strongest along James Slaughter Road, opposite the Woodchase subdivision. Again, the signature of the interference was RF carriers, about 1 kHz apart, with a bit of digital modulation now and then, including the tik-tik-tik at about a 2 Hz rate.

This interference was across 21.9-25.7 MHz (including the amateur radio 12 meter band) and 27.5-30.0 MHz (including the amateur radio 10 meter band). The interference was S-9 along James Slaughter Road, and S-5 in the Food Lion parking lot at NC-55, and obliterated several amateur radio signals that I was monitoring.

In the Woodchase subdivision, I also heard the "BPL signature" signals on several other points in the high frequency spectrum. The signals

were weaker, but plainly audible. I also heard signals in the 7 and 24.5 MHz area about a mile further north on James Slaughter Road, near the Whitehurst subdivision. These signals were S-6 to S-9 for about 1/4 mile along James Slaughter Road.

I most recently heard this interference on March 5th, 2004.

Finally, on February 28, 2004, I personally visited the homes of three amateur radio operators who live in the vicinity of the Progress Energy Phase II BPL trials, and observed interference as received at their stations as follows:

Mike Payne KM4UT
5813 HEATHILL CT
Raleigh, NC

Mike lives .7 miles south of the trial site on Holland Church Road. He is using a dipole antenna at about 30 feet. I observed that he was receiving a clear but weak BPL "signature" in the top half of the 10 meter band, above 28.8 MHz, and many smaller clusters of individual carriers in the band below that.

Ted Root N1UJ
509 WYNDHAM DR
Fuquay-Varina, NC

Ted is about a half mile southwest of the James Slaughter Road site. He is also using a dipole antenna at about 40 feet. He was receiving weak but clear BPL signature signals across the 25 and 28 MHz areas.

Roland Erickson WA0AFW
201 WILBON ROAD 301B
Fuquay-Varina, NC

Roland is about a half mile south of the James Slaughter Rd. site. He is using a dipole antenna in the attic of a retirement village building. He has a very high ambient noise level (S-6) across the 25 and 28 MHz bands, but was receiving the BPL signature signals clearly above that noise level across those bands.

You might ask if my complaint of interference while mobile, some distance from my home, is justified. I contend that it is, for several reasons.

First, amateur radio is a very "mobile" service. Tens of thousands of amateur radio operators have and use high frequency mobile equipment, and we can be found anywhere, using all hf bands, at completely unpredictable times.

Second, the Progress Energy Phase II trials are in very limited area tests. There are no amateur radio operators living inside the neighborhoods being served, though there are several within interference range - about a mile. We are justified in traveling to the sites with normal amateur radio equipment, operated in a normal manner, to observe and complain about interference we receive. This observation

3/29/2004

Message

must be extrapolated to a wider geographic area to anticipate the kind of interference that would be received if BPL were to be widely deployed, especially in denser suburban and urban neighborhoods.

You might also ask if weak BPL signals constitute harmful interference. I contend that they do. Amateur radio operation is unlike most other radio operation, in that amateurs tune across their band segments looking for signals. Often we are looking for weak signals from distant parts of the world. Our predominant modes are single sideband and cw. In those modes, a series of carriers 1 kHz apart presents a most irritating series of "beat notes" - tones that vary in pitch as the spectrum is tuned. At 1 kHz spacing, they are continuously present in a receiver using customary bandwidth filters. And even weak BPL signals can make weak amateur radio signals difficult or impossible to receive.

The presence of any BPL signal of any strength at either a home or mobile station at any location is an unwarranted incursion in the amateur radio bands, and is also a problem for anyone tuning shortwave broadcast or other radio services.

Thanks for your consideration. I look forward to hearing the results of the investigation into my complaints.

Sincerely,

Gary Pearce KN4AQ

Gary Pearce KN4AQ editor, SERA Repeater Journal
Cary, NC www.sera.org
919-380-9944 kn4aq@sera.org
kn4aq@arrl.net
AOL/Yahoo Instant Messenger: KN4AQ
(send e-mail to be put on my "buddy list")

Alan Stillwell

From: James Burtie
Sent: Wednesday, March 31, 2004 8:09 AM
To: Alan Scrim; Alan Stillwell; Bruce Franca; Bruce Romano; Anh Wride
Subject: FW: Complaint: BPL Interference in N.Raleigh, NC

-----Original Message-----

From: Anthony, Len [mailto:len.anthony@pgnmail.com]
Sent: Tuesday, March 30, 2004 8:19 PM
To: James Burtie
Cc: Oja, Matt; Godwin, Bill
Subject: RE: Complaint: BPL Interference in N.Raleigh, NC

Progress Energy
Andrew Stoy

Thank you for forwarding the attached complaint to my attention. The BPL equipment used in the Wakefield trial has now been deactivated and removed. Therefore, all interference in this area should have ceased. Len Anthony

-----Original Message-----

From: James Burtie [mailto:James.Burtie@fcc.gov]
Sent: Mon 3/29/2004 4:08 PM
To: Anthony, Len; Alan Scrim; Alan Stillwell; Bruce Franca; Bruce Romano; Anh Wride
Cc:
Subject: FW: Complaint: BPL Interference in N.Raleigh, NC

-----Original Message-----

From: andy stoy [mailto:astoy2@nc.rr.com <mailto:astoy2@nc.rr.com>]
Sent: Monday, March 29, 2004 1:49 PM
To: len.anthony@pgnmail.com; Anh Wride; James Burtie; Alan Stillwell; wlrfi@arri.org; w4fal@smithchart.org
Subject: Complaint: BPL Interference in N.Raleigh, NC

Andrew Stoy, K4MTN
1809 Bagshot Ct.
Wake Forest, NC 27587
919/554-0342
K4MTN@arri.net

March 26, 2004

Mr. Anthony:

I am an amateur radio operator who holds an Extra Class license issued by the FCC. Since I live in the Wake Forest area, I frequently travel Falls of Neuse Rd. in the area of the Wakefield development. My vehicle is equipped with a Yaesu FT-900 high frequency transceiver which I use for regular communication on the 10, 15 and 20 meter amateur bands.

In the Fall of 2003 I started to notice VERY STRONG interference as I drove past the entrance of the Wakefield development near the Wakefield High School. I have continued to hear this interference on a regular basis, but was unable to identify it.

Finally, on March 18, 2004, my communications on the 10 meter band was completely wiped out by the interference. I parked my vehicle in the Wakefield High School parking lot and tried to determine the scope and origin of the interference using my transceiver and 8' whip antenna

tuned for 10 meters.

The noise was a series of carriers a little over 1 kHz. apart. I was able to hear it from 26.0075 MHz to 28.7015. In addition to the carriers I could hear a constant ticking sound across the 10 and 11 meter bands.

While monitoring this interference, communications was impossible due to the high noise level. Anything that could cause this much interference and render communications useless caused me to be very concerned. When I

returned home I contacted some local Amateurs to see if they had experienced anything like this. I then learned that I had been listening to a BPL test installation.

I wanted to notify you and other interested parties, especially the FCC, of the magnitude of this interference to assigned Amateur Service and Citizens Service frequencies. Feel free to contact me to discuss my experiences further if you would like additional information.

Regards,
Andrew Stoy

Alan Stillwell

From: James Burtie
Sent: Thursday, April 15, 2004 7:36 AM
To: Alan Stillwell; Bruce Franca; Bruce Romano; Anh Wride; Alan Scrim
Subject: FW: Progress Energy Interference Complaints - Who should these be directed to?

-----Original Message-----

From: Frank A. Lynch [mailto:flynch@nc.rr.com]
Sent: Tuesday, April 13, 2004 2:58 PM
To: Riley Hollingsworth; Raymond Laforge; James Burtie
Cc: Gary Pearce; Tom Brown; Frank A. Lynch
Subject: Progress Energy Interference Complaints - Who should these be directed to?

The local amateur radio community, land mobile, and other interested users of the 2 MHz to 50 MHz spectrum in and around the Progress Energy BPL trial in southern Wake County, would like a determination from the FCC, to whom interference complaints are to be addressed.

Initially we (the Amateur Radio Community) were told that since Progress Energy had an experimental license, that the Experimental Licensing Division of the Office of Engineering and Technology was responsible for those complaints.

Through some investigation on my part, I have learned that both of the current trial areas are outside the 20 km radius specified in WD2CXA;

Within a 20 km radius of Raleigh (WAKE), NC - NL 35-56-58; WL 78-34-23

Furthermore, queries to Progress Energy's Bill Godwin also indicated that it was his understanding that the Experimental license was only for the initial "Phase I" trial in Wakefield Plantation in northern Wake County.

That implies, does it not, that the Amperion equipment in the Southern Wake County has now achieved Part 15 compliance by either (a) Verification, (b) Declaration of Conformity, or (c) Certification. If not they would be operating with non-type accepted equipment, correct?

Does this now mean that responsibility for interference complaints falls on the FCC Enforcement Bureau? We are anxious to get some resolution to interference in the amateur radio bands. While Progress has attempted to "move" and "notch" spectrum around the amateur radio bands, they have not been entirely successful in doing so. A full report of the April 6, 2004 activity with Progress Energy, Tom Brown N4TAB, and Gary Pearce KN4AQ is available on the ARRL web page at <http://www.arrl.org/news/stories/2004/04/08/3/?nc=1>

Finally, isn't it true that even for verified equipment (which is probably the type of certification that would have been done on this equipment), that someone at the FCC has a test report. In reviewing the data submitted against the experimental license, I note that a FCC Part 15B report was submitted. The copy that is on the FCC's public experimental licensing site, has had all the pertinent test results removed from it. Would it be possible to get a copy of the full report for use in preparing comments to the NPRM?

We also note that equipment we have looked at on the overhead spans and equipment that was photographed by the press during Chairman Powell's visit in March, doesn't appear to have the required identification as per the FCC rules;

Sec. 2.954 Identification.

Devices subject only to verification shall be uniquely identified by the person responsible for marketing or importing the equipment within the United States. However, the identification shall not be of a format which could be confused with the FCC Identifier required on certified, notified or type accepted equipment. The importer or manufacturer shall maintain adequate identification records to facilitate positive identification for each verified device.

Sec. 15.19 Labeling requirements.

(a) In addition to the requirements in part 2 of this chapter, a device subject to certification, or verification shall be labeled as follows:

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

I look forward to hearing from you on this matter.

Frank A. Lynch, W4FAL
ARRL NC Technical Specialist,
2528 Oakes Plantation Drive
Raleigh, NC 27610-9328
919-740-3957
w4fal@smithchart.org